

Notes on Microlepidoptera with Descriptions of New Species.

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Isophrictis similiella Chambers.

Gelechia similiella Chambers. Can. Ent. IV, 193, 1872.

Paltodora similiella (Chambers) Busck, Proc. U. S. N. M., XXV, 779, 1903; XXX, 722, 1906.

The only reference to the life history of this species is found in Mr. Busck's *Revision of American Gelechiid Moths*, where he mentions the rearing of poor specimens from flower heads of sunflower from Oklahoma.

The larvae bore in the receptacle of the flower heads of black-eyed Susan (*Rudbeckia hirta*). At pupation the larva burrows down into the stem for a distance of one-fourth to two or three inches, where it makes an opening to the outside, and then pupates in the stem.

The species is very common locally around Cincinnati, nearly every flower head containing one or more of the whitish larvae. The moths emerge during the flowering period of the plant, which extends from June to August.

Aristotelia robusta n. sp.

Head and face yellowish fuscous, palpi dark fuscous irrorated with black; second segment whitish inwardly and at extreme apex outwardly, third segment shorter and thicker than usual, apical half white; extreme tip sometimes black. Antennae blackish fuscous in the apical half, with the last segment, and fifth and tenth from the tip white; beginning with the fourteenth segment from the tip, paler fuscous, annulate with yellowish white.

Fore wings dull ochereous rather densely overlaid with purplish fuscous dusting, especially toward apex, where it obscures the ground color. Before the middle of the wing and beginning within the costa, a darker shade crosses the wing very obliquely to the fold where it spreads out, rarely reaching the dorsal margin near tornus. At two-thirds a not very oblique yellowish costal streak passes to the middle of the wing just beyond the rather elongate black spot at the end of the cell. A dark line at the base of the cilia is broken on the costa by four faint ochereous spots; similar pale spots sometimes visible along termen. Hind wings fuscous. Legs dull yellowish, densely dusted with dark fuscous outwardly. Alar expanse: 11-12 mm.

Type (δ) and 30 paratypes reared from larvae mining

leaves of *Scirpus atrovirens*, Cincinnati, Ohio. Type and paratypes in writer's collection, paratype in collection of the Academy of Natural Sciences of Philadelphia.

The larvae begin to mine early in April. The mine extends toward the tip of the leaf, beginning as a small transparent blotch, with an opening on the under side of the leaf; following this is a linear green portion with sides nearly parallel, in which the leaf substance is not eaten; beyond this the mine expands and becomes larger and semi-transparent. When ready to pupate, the larva leaves the mine through a circular hole in the upper side of the linear green portion. Larva whitish with head black, thoracic plate dark brown, a brown spot on posterior half of 9 and anterior half of 10. The imagoes emerge in early June.

This species is most easily distinguished by the thickened dark palpi with sharply contrasting whitish apical half of the third segment.

Telphusa agrifolia n. sp.

Palpi with second segment dark gray, irrorated, with inner side and sometimes extreme tip whitish, third segment black, sometimes with an indistinct whitish annulus near tip. Face gray, head blackish, irrorated; antennae black, with gray annulations.

Fore wings with large patches of raised scales; ground color brownish black, sometimes with golden brown reflections, especially in the apical half, and sometimes unevenly dusted with pale brownish and whitish scales.

In one form an oblique whitish band crosses from basal fourth of costa to near middle of dorsum, and follows the dorsum, but is interrupted just before the tornus by an extension of ground color to the margin; at the tornus it curves upwards and ends beneath the apex; its shape and position are almost exactly those of the white band in *T. longifasciella* Clemens. An inwardly oblique irregular line of paler scales sometimes crosses the wing from apical third of costa to just beyond the middle of the dorsum. The ground color is darkest immediately before the oblique band, and before the curved portion of the whitish area beneath the apex.

In the more common form, the white is almost everywhere replaced by dull blackish blue; a longitudinal streak of whitish scales sometimes remains just below basal fourth of costa; a few pale scales follow the inner edge of the curved portion beneath the apex.

Three darker spots along costa in apical third, a dark patch at apex.

and three or four small dark spots along termen. The patches of raised scales are situated as follows: one within the dorsal margin near base; beyond it another at the inner edge of the white band; raised scales border the white band also just above the fold; beyond the fascia on the disk a large tuft, and beyond this tuft, but nearer the costa, a minute tuft; obliquely below the first of these, a larger tuft in the fold, followed by a large tuft above the fold, immediately above the second of these tufts, and sometimes connected with it, is a small tuft. Just above the space between the two large tufts the ground color is darkened. A line of slightly raised scales borders the inner edge of the curved portion of the band beneath apex. Hind wings brownish gray, darker along the margins, cilia concolorous. Legs fuscous, irrorated, with tips of segments whitish. Alar expanse 13.5-14 mm.

Type (♂), a specimen of the dark form, reared from larva on California live oak, *Quercus agrifolia*; Alameda County, California. Paratypes: Alameda County; Redwood Canyon, Marin County; Dutch Flat, Placer County; Mt. Saw Tooth, Tulare County, California, 11,500 ft. Type in the writer's collection, paratypes in the collection of the Academy of Natural Sciences of Philadelphia, the California Academy of Sciences, and in the U. S. National Museum.

The following note will aid in identifying the larva: Head and next two segments dark plum-colored, remainder of body grayish with tubercles dark.

This species is the closest ally of the eastern *T. longifasciella* Clemens, but is very distinct from it. The dark form is the most common; specimens with a distinct whitish band are rather unusual, but all gradations between the two occur together.

***Recurvaria ceanothiella* n. sp.**

Face white, head dusted with dark fuscous; palpi black, second segment with a narrow white annulus near apex, and another at extreme apex, more whitish inwardly, third segment with a white annulus at base and middle, extreme tip white. Antennae dark fuscous, basal segment white anteriorly, stalk annulate with gray.

Fore wings whitish, densely dusted with dark fuscous; three darker shades cross the wing obliquely, at one-fourth, one-half and three-fourths respectively, sometimes scarcely distinguishable from the rest of the wing except as dark patches on costa. Between the first of these and the base of the wing, a small black spot on costa; between

the first and second dark shade, a black spot within the costa; beyond the third dark shade, a narrow whitish streak, sometimes almost obliterated by dusting, curves inward just within the costa, then runs obliquely outward to the termen just beyond tornus. A more or less distinct black dot in apex, preceded by one or two more or less distinct black dots on costa and termen. Three large patches of black raised scales in a line about equally spaced, the first two in the fold, the third above it, and lying in the dark shades. Nearer the base than the first of these is a small black spot on the dorsal margin. Hind wing without hair pencil in male. Legs gray with tips of segments silvery; a faint paler bar across hind tibiae. Alar expanse: 11-13 mm.

Type (δ) and a large series of paratypes reared from larvae mining leaves of *Ceanothus divaricatus* Nutt., Dutch Flat, Placer County, California. Type and paratypes in the writer's collection, paratypes in the collections of the Academy of Natural Sciences of Philadelphia and the California Academy of Sciences.

The mine starts on the lower side of the leaf, usually next to the midrib; the entrance guarded by a short tube of silk. The mine is at first linear, with branches extending out from it; later blotchlike, including the linear portion. Pupa in a cocoon between two leaves tightly spun together. Larvae received February 20, imagoes April 15 to May 6.

The curved pale streak at three-fourths and the line of three patches of raised scales are the most distinguishing characteristics of this species.

***Brachmia hystricella* n. sp.**

Face pale straw-colored, head brownish ochereous, palpi brownish ochereous, upper and lower edge with a fine white line from base to apex, antennae brownish, banded beneath with whitish.

Thorax and fore wings brownish ochereous or fuscous; veins distinctly outlined with pale straw color; costal and dorsal margins and a streak from middle to end of cell also whitish; a curved white streak, with convex side toward the costa, lies between the cell and costal margin. There is a round black discal spot on the middle of the cell, and a similar one at the end of the cell; an elongate black spot in the fold beginning below the first discal; all three spots edged with white scales. Costal cilia straw-colored, cilia on termen fuscous, sharply contrasting along a diagonal line at apex; margin of termen blackish, cilia with two parallel fuscous lines, of which the outer is usually the darker and broader. Hind wings whitish straw-colored or grayish. Legs straw-colored. Alar expanse: 13-15 mm.

Type and seven paratypes reared from larvae in rolled leaves of *Hystrix patula*, Cincinnati, Ohio. *Type* and paratypes in writer's collection, paratype in collection of the Academy of Natural Sciences of Philadelphia.

There are several generations a year; larvae winter in the rolled leaves and reach maturity early in spring.

Larva with head brownish ocherous, lateral margins dark reddish brown, the dark brown continuing on the whitish first thoracic segment as two posteriorly converging lines, next four segments dark reddish brown, anterior margins of second and third thoracic segments whitish, remaining abdominal segments whitish, with subdorsal brown line and oblique brown bar extending from subdorsal line at anterior margin of each segment posteriorly and ventrally.

***Brachmia badia* n. sp.**

Head and face ocherous, palpi with a white line beneath; antennae ocherous, ends of segments brownish ocherous above.

Thorax and fore wings ocherous, the scales in the outer half of the wing tipped with a slightly deeper more reddish color. A dark brown discal dot in middle of cell, and a larger slightly transverse spot at end of cell, a dark brown plical spot a little anterior to the first discal. Cilia concolorous with wing; with two faintly indicated darker lines along the termen. Hind wings whitish. Legs brownish ocherous. Alar expanse: 16 mm.

Type (♂), Fredalba, California, August 13 (G. R. Pilate). *Type* in writer's collection.

The addition of this species to our fauna is interesting because it shows the extended distribution of the genus in the United States.

***Ethmia longimaculella* Chambers.**

Ethmia longimaculella Chambers, Can. Ent., IV, 43, 1872; Dyar, Jour. N. Y. Ent. Soc., X, 207, 1902; Barnes & Busck, Contrib. Nat. Hist. Lep., IV, pl. XVII, f. 14, pl. XXXVI, f. 1, 1920.

syn. *walsinghamella* Beut., Ent. Am., V, 9, 1889.

Large numbers of the larvae of this species were found feeding on leaves of *Lithospermum lalifolium*, Clermont County, Ohio, July 10. The larva when young spins a web on the under side of a leaf, stretching from midrib to a lateral vein, but not reaching the margin. At this time it eats the lower side of the leaf, leaving the upper epidermis untouched. Later it folds the leaf upwards, bringing the margins together near

the base; within this it spins a fine web spreading outwardly; the lower epidermis is left uneaten now.

The larva is a very conspicuously marked creature: head almost black, first thoracic segment golden brown, second thoracic segment very dark reddish brown, remaining segments somewhat paler brown with four irregular pale brownish yellow conspicuous transverse bands situated as follows: at the anterior margin of the third thoracic, across the posterior margin of the third thoracic and anterior margin of the first abdominal, at the posterior margin of the fifth abdominal, and at the posterior margin of the sixth abdominal segments respectively.

Cocoon of silk and bits of rubbish on the surface of the ground. Imagoes May 12-15 of the following year.

***Heliozela aesella* Chambers.**

Heliozela aesella Chambers, Can. Ent., IX, 108, 1877.

The larvae produce flattened galls on leaves of grape. The gall consists of an irregularly shaped thickening of the leaf, situated on a vein and extending to either side of it, the area involved rarely being more than one centimeter in diameter, with a thickness perhaps three or four times that of the leaf itself. The galls are paler in color than the rest of the leaf and about equally distinct on the upper and lower surface. The larva consumes most of the leaf substance in the gall, especially in a large oval area, where only the epidermis is left. At maturity it cuts from this area, an oval case, in outline similar to that of *Anlispila*. This case, however, does not remain flat, but is rolled up into a spindle, which falls to the ground. The spindle is flattened at each end, where a semi-circular fissure is left, guarded by the closely appressed, flattened, projecting ends. The spindle is then covered with fine particles of earth, and lined throughout with close whitish silk. Within this cocoon an inner pupal chamber is partitioned off; this tapers to a point at the posterior end, but at the anterior end is closed by a flat transverse sheet of papery silk. In emergence, the pupa pushes up this sheet of silk and protrudes from the cocoon to the side of the median line between the flat projecting ends.

The moths appear in the latter part of April and in early May; the galls develop on the expanding leaves and are fully formed by the beginning of June. The larvae reach maturity

about the middle of June. There is but one generation a year.

In the vicinity of Cincinnati I have found the galls only on *Vitis cordifolia*. In other localities it occurs on other species of grape; specimens of the work on a cultivated variety from Boston were submitted to me for identification some years ago by Mr. J. L. King, at that time on the staff of the Ohio Agricultural Experiment Station. In a letter accompanying the specimens he wrote that it has also been observed in the grape belt in northern Ohio.

Argyresthia undulatella Chambers.

Argyresthia undulatella Chambers, Can. Ent., VI, 10, 1874; Busck, Proc. Ent. Soc. Wash., XXXII, 22, 1907.

The larvae mine in the inner living bark of the main trunk and branches of the red elm (*Ulmus fulva*), hollowing out an elongate cavity. In early spring the presence of the larvae is shown by the brownish frass which is pushed to the outside. Early in April, in a crevice of the bark, it spins its cocoon, consisting of an inner spindle-shaped cocoon of very fine soft silk, covered on the outer side with a coarse web of irregular mesh. The cocoons are often found on the trunks in great numbers.

Coleophora coenosipennella Clemens.

Coleophora coenosipennella Clemens; Proc. Acad. Nat. Sci. Phila., 5, 1860; Tin. No. Am., 88, 1872.

The type of this species is not now in existence; but specimens of a species feeding on seeds of *Stellaria pubera* (great chickweed) agree so closely with Clemens' description of that species that I have no hesitation in determining them as that species. There is, however, considerable variation in ground color; the color ranges from very pale yellow to brownish. In the palest specimens, the white streaks are broader than the intervening streaks of ground color; in the darker specimens the reverse is the case, and the ground color almost obliterates the short oblique white streaks between the terminal portions of the costal and distal streaks. The basal segment of the antennae and also two or three succeeding segments are swollen with closely appressed scales. The wing expanse is 11.5—12 mm.

Specimens determined as this species have been placed in

the collection of the Academy of Natural Sciences of Philadelphia, and in the U. S. National Museum.

The moths appear in the latter half of April. Very young larvae were collected feeding within the unopened seed-pods of the chickweed in the middle of May. Even at this time, the flowering stems are wilted down and lying on the ground. The first silken cases were observed on May 25; this silken case is attached to the outside of the pod and the larva feeds on the seeds within. When the valves of the pod begin to curl open, a smooth sheet of silk is spun across, which prevents the seeds from dropping out. To this sheet of silk the case is now usually attached. The larvae feed for about ten days after spinning the silken case. Case short cylindrical, 6 mm. long, with strongly deflexed mouth, three-valved at apex; yellowish white at first, grayish when mature, and decorated with numerous dark reddish granules.

***Coleophora borea* n. sp.**

Face and mid-dorsal line of head brownish ochereous, sides of the head whitish, palpi white above, brownish ochereous or fuscous beneath, second segment with a pointed tuft projecting more than half the length of the third segment; antennae white, annulate with brownish ochereous or fuscous, basal segment and four or five succeeding segments somewhat thickened with scales.

Fore wings brownish ochereous or fuscous with the veins except the base of the upper margin of the cell distinctly outlined in white; dorsal margin white; interspaces between the costal veins shading to dark brown at the base of the costal cilia; the dark brown usually forms a streak below vein 7, extending into the apical cilia; a broad streak sometimes dark brown, sometimes scarcely deeper than the ground color, extends the length of the cell and ends in a dark brown spot, which is most conspicuous in the paler specimens. Cilia brownish ochereous intermixed with white scales, which form a line at the base of the cilia along the termen. Hind wings and cilia fuscous. Legs whitish ochereous, first two pair fuscous outwardly, posterior pair with a fuscous line along the outside. Alar expanse: 15-16 mm.

Type (♂) and 25 paratypes reared from larvae mining into seeds of the climbing false buckwheat (*Polygonum scandens*); Cincinnati, Ohio.

Type and paratypes in the writer's collection; paratypes in the collection of the Academy of Natural Sciences of Philadelphia and in the U. S. National Museum.

The moths appear in the first half of September. The larvae at first feed within the seeds and at the end of November or the beginning of December spin the first case, which is yellowish white, straight and cylindrical, more or less thickly strewn with granules, especially near the mouth, with the apex at this time roughly two-valved. The larvae spin and feed actively when the temperature is well below the freezing point; in fact development takes place more rapidly out-of-doors than in a warm room. The case is gradually enlarged and thickened, becoming dark brownish gray except along a slight projecting keel on the ventral side. The larvae feed during the winter becoming full grown early in March, the case is now almost black, stout cylindrical, 8-9 mm. long, three-valved at apex, with the plane of the mouth forming a very acute angle with the long axis.

The distinguishing characters of this species are the distinct undusted white lines and the dark streak and spot at the end of the cell. From *C. amarantella*, which also possesses a similar dark spot, it is separated by the absence of dusting. The very different case separates it from the other Polygonum-feeding species, *C. shaleriella*, which is similarly marked with white streaks, but lacks the dark streak and spot.

***Coleophora dupliscis* n. sp.**

Face white mixed with pale ochereous; palpi white above, pale ochereous inwardly, fuscous outwardly; antennae white, with first segment somewhat thickened with anteriorly projecting pale brownish scales; stalk either white or with distinct ochereous or fuscous annulations (the variation independent of sex).

Fore wings grayish ochereous, sometimes brownish; very rarely pale brownish ochereous; broad white streaks follow the course of the veins in the costal half of the wing, with the spaces between them dusted with blackish scales and darkening toward margin, the white streak along upper margin of cell also somewhat dusted in its outer half and usually confluent with a short streak through the outer half of the cell; all these white streaks in the costal half of the wing are often confluent with almost entire absence of dusting except toward apex. A broad white dusted streak follows the fold, with the ground color on either side of it not dusted; dorsal margin white. Cilia pale brownish ochereous with scales at their bases white. Hind wings and cilia pale fuscous. Legs white, fore and middle pair outwardly fuscous, posterior pair with a fuscous line on the outer side. Alar expanse: 11.5-14.5 mm.

Type (♀) and eleven paratypes reared from larvae mining seeds of *Aster shortii*, eleven reared from *Aster cordifolius*, twenty from *Solidago caesia* and *Solidago latifolia*, many specimens captured on flowers of Aster in September, all at Cincinnati, Ohio; a series taken on goldenrod flowers, Balsam, North Carolina, August 15-25. Type and paratypes in writer's collection, paratypes in the collection of the Academy of Natural Sciences of Philadelphia and in the U. S. National Museum.

The larvae mine at first within the seeds, later (in October and early November) constructing buff silken cases, marked with darker longitudinal streaks and encircled with backwardly projecting pappus attached near the mouth; occasionally entire dry disk flowers are attached to the case in the same manner; numerous small fragments of flowers are attached near apex. Case short cylindrical, bulging somewhat behind mouth, which forms an acute angle with the axis; apex prominently three-valved, the angles sharp and at base projecting somewhat beyond the general outline of the case.

The following observations on the method of attaching the pappus and constructing the case after the larva leaves the seed may be of interest. The pappus is cut off at equal distances from the seed and passed forward between the legs. The pieces are fastened together around the body of the caterpillar (*i. e.*, attached by the larva working inside) by a few strands of silk. At first they project irregularly, some even pointing forward. When sufficient pieces have been put in position the case itself is spun within the loosely fastened-together pappus and the deflexed mouth is added. At first the case merely converges toward the apex; later the apex is made distinctly three-valved.

The largest specimens are those reared on *Aster shortii*, the smallest on *Solidago caesia*; apparently the difference in size is due directly to difference in food supply resultant upon the small size of the seeds of the latter plant.

In general, this species may be distinguished by the pale costal half of the wing in contrast with the darker dorsal half. Pale brownish ochereous almost undusted specimens, which sometimes occur, are almost indistinguishable from *C. gran-*

ifera. This need not result in confusion of the two species, as *C. granifera* emerges almost three months earlier. The case of *C. duplicis* is almost identical with that of *C. ericoides* on another species of *Aster*, but besides differences in color and markings *C. ericoides* is much more slender and narrow-winged.

***Coleophora biforis* n. sp.**

Head pale grayish ochereous; palpi whitish, apical half of second segment blackish outwardly; lower edge of third black. Antennae with basal segment thickened with scales, stalk white, with conspicuous dark brown annulations.

Fore wings pale grayish ochereous, marked with whitish lines as follows: A distinct white streak from base along costa for about one-half the wing length; a distinct rather broad white streak from base along upper margin of cell, forking at one-third, the upper fork a continuation of the broad white streak and running out to the middle of costa, the lower fork continuing through the middle of the cell as a very indistinct whitish line, which at the end of the cell bends up to reach costa near apex. Sometimes at the bend it sends a branch to termen. Between the ends of the forks, two short usually detached whitish lines run to costa (sometimes these are branches of an indistinct line along upper margin of cell); narrow whitish lines along fold and along dorsum. Usually the white streak along costa and the white streak along upper margin of cell to middle of costa are the only distinct white streaks. Extreme base of costa blackish. Hind wings pale gray, cilia toward apex ochereous-tinged. Legs pale grayish ochereous. Alar expanse: 11.5-12.5 mm.

Type (δ) and five paratypes reared from larvae mining into seed pods of *Luzula campestris*, Cincinnati, Ohio. Type and paratypes in the writer's collection.

The cases may be found attached to the seed pods in April and May; the moths emerge the following spring at the time of blooming of the food plant. The completed case measures 8-8.5 mm. in length, slender cylindrical, tapering to the three-valved apex. The sides of the obtuse apical angles of the valves are very short; from the point of union of adjacent valves, a gradually lowering ridge runs about half-way down the case.